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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	10/791,527	SAEY, DIMITRI
	Examiner	Art Unit	
	Siu M. Lee	2611	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>03 March 2004</u>.
2a) ☐ This action is **FINAL.**   2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1-26</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) <u>1-26</u> is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on <u>03 March 2004</u> is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter which the applicant regards as his invention.

2.   Claim 21 recites the limitation "the receiving means" in line 2. There is

insufficient antecedent basis for this limitation in the claim.

3.   Claim 10 recites the limitation "the carriergroup signal –to-noise ratio" in line 1.

There is insufficient antecedent basis for this limitation in the claim.

   Appropriate correction is required.

Claim Rejections - 35 USC § 102

4.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public
> use or on sale in this country, more than one year prior to the date of application for patent in the United
> States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by
> another filed in the United States before the invention by the applicant for patent or (2) a patent
> granted on an application for patent by another filed in the United States before the invention by the
> applicant for patent, except that an international application filed under the treaty defined in section
> 351(a) shall have the effects for purposes of this subsection of an application filed in the United States
> only if the international application designated the United States and was published under Article 21(2)
> of such treaty in the English language.

5.   Claims 1, 8, 20 are rejected under 35 U.S.C. 102(e) as being anticipated by

Duvaut et al. (US 7,068,592 B1).

   Duvaut et al. discloses a modem (ADSL modem-R 480 in figure 5) comprising:

a carriergroup transmitting means coupled to a transmission channel (ADSL modem-R 480 comprises a ADSL transceiver unit (ATU) 560, therefore, it is inherent that ADSL modem-R 480 contains an transmitting means coupled to a transmission channel (twisted pair phone line 455), column 6, lines 46-47);

a carriergroup receiving means coupled to the transmission channel for receiving parameters relating to a plurality of carriers in the transmission channel (receive (or sink) processor 580 in figure 5, column 6, lines 46-47); and

a carriergrouping means (logic circuit 705 in figure 7A), coupled to the carriergroup transmitting means and to the carriergroup receiving means (sink processor 580 comprises a logic circuit 705, therefore, logic circuit 705 is coupled to the carriergroup transmitting means and the carriergroup receiving means, column 8, lines 65-66), for determining at least one carriergroup parameter (sink processor 580 comprises a logic circuit 705, which is configured to determine the cluster pattern for clustering the insufficient-capacity data bins (carrier with signal to noise ratio not greater than a pre-defined threshold) at the source site, column 8, line65-column 9, line 14) and at least one carrier group (bins with SNR smaller than the pre-defined threshold) for the plurality of carriers in the transmission channel based on the parameters received by the carriergroup receiving means (the logic circuit includes a signal to noise ratio (SNR) calculator 706 in figure 7A, which calculates the SNR of each bin associated with data transmitted from the source site);

wherein the carriergroup transmitter means transmits at least one message to the transmission channel comprising the at least one carriergroup parameter and the at

least one carrier group (the sink site determine a cluster pattern and transmit that

cluster pattern to the source site, column 9, lines 16-17).

6.   Claims 1, 4-6, 8, 11-13, 15, 17-20, and 23-25 are rejected under 35

U.S.C. 102(b) as being anticipated by Peeters et al. (US 2001/0012783 A1).

(1) Regarding claim 1:

Peeters et al. discloses a modem comprising:

a carriergroup transmitting means (BiGi_Tx of Rx modem in figure 1) coupled to

a transmission channel (Line (twisted pair) in figure 1);

a carriergroup receiving means (DMOD of Rx modem in figure 1) coupled to the

transmission channel (Line (twisted pair) in figure 1) for receiving parameters relating to

a plurality of carriers in the transmission channel; and

a carriergrouping means (CHANNEL and BiGi_PROD of Rx modem in figure 1),

coupled to the carriergroup transmitting means and to the carriergroup receiving means,

for determining at least one carriergroup parameter (constellation information message

that contains the bit loading information and the gain information, paragraph 0019, lines

13-16) and at least one carrier group for the plurality of carriers in the transmission

channel based on the parameters received by the carriergroup receiving means

(channel analyzing circuitry CHANNEL receives a predetermined sequence from the Tx

modem and measures the signal to noise ratio for each carrier, paragraph 0019, lines 4-

7);

wherein the carriergroup transmitter means transmits at least one message to the transmission channel comprising the at least one carriergroup parameter and the at least one carrier group (the constellation information message is transmitted over the phone line LINE from the constellation information transmitter BiGi_Tx to the constellation information receiver BiGi_RX, paragraph 0019, lines 17-20).

(2) Regarding claim 8:

Peeters et al. discloses a method for grouping a plurality of carriers in a DMT communication system, the method comprising the steps of:

determining at least one carrier group for the plurality of carriers (after channel analysis, the carriers are grouped in subset of carriers, paragraph 0021, lines 3-6);

determining at least one carriergroup parameter for the at least one carrier group (the constitution of the subsets of carriers is determined); and

sending at least one message comprising the at least one carriergroup parameter (the subsets of carriers typically will not contain the same number of carriers and the constitution of the subsets will be reported via message, paragraph 0021, lines 7-10).

(3) Regarding claim 11:

Peeters et al. discloses wherein the step of determining a carriergroup parameter for the carriergroup further comprises the step of determining at least one carriergroup bitloading for the at least one carriergroup (the constellation information message that indicates bit and gain assignment to the upstream carriers is thus also kept short, paragraph 0022, lines 4-6).

(4) Regarding claim 12:

Peeters et al. discloses wherein the at least one carriergroup has a fixed size

(the examiner interpret the size is refer to the number of carrier in the carriergroup)

(Peeters discloses another embodiment that the total of 4096 carriers are grouped into

8 subsets, each subset contains 512 carriers, paragraph 0005, lines 6-14).

(5) Regarding claim 13:

Peeters et al. discloses wherein the size of the at least one carriergroup of the

plurality of carriers is variable (the subsets of carriers typically will not contain the same

number of carriers, paragraph 0021, lines 7-10) and determined dynamically (paragraph

0023 states that threshold can alternatively be applied during operation to adapt the

carrier constellations according to changes of the channel characteristic, this means

that the method can be performed dynamically during operation depending on the

characteristic of the channel).

(6) Regarding claim 15:

Peeters et al. discloses a method for grouping a plurality of carriers in a DMT

communication system, the DMT communication system comprising a near end (Rx

modem in figure 1) and a far end modem (Tx modem in figure 1), the method

comprising the steps of:

determining at least one carriergroup from the plurality of carriers (the 4096

carriers are grouped in a 8 group subsets each consisting of 512 carriers);

determining a carriergroup signal-to-noise ratio for the at least one carriergroup

(the channel analyzing circuitry CHANNEL upon transmission of a predetermined

sequence measures the signal-to-noise ratio (SNR) for each carrier f_0 to f_{4095}, paragraph

0019, lines 4-13);

determining a carriergroup bitloading and a carriergroup gain for the at least one

carriergroup based on the carriergroup signal-to-noise ratio (this signal-to-noise ratio

values are used by the constellation information producer to determine for each carrier

subset the number of bits that can be modulated on each carrier of this subset and the

gain where each carrier of this subset should be transmitted with (paragraph 0019, lines

8-13); and

using the carriergroup bitloading and the carriergroup gain for the at least one

carriergroup for transmitting messages from the near end modem to the far end modem

(the set of parameter values for a carrier subset may consist of a bit number and a gain

value, as a result carriers belonging to the same subset will be modulated with an equal

amount of bits and will be transmitted with the same gain, paragraph 0008).

(7) Regarding claim 17:

Peeters et al. discloses wherein the at least one carriergroup has a fixed size

(the examiner interpret the size is refer to the number of carrier in the carriergroup)

(Peeters discloses another embodiment that the total of 4096 carriers are grouped into

8 subsets, each subset contains 512 carriers, paragraph 0005, lines 6-14).

(8) Regarding claim 18:

Peeters et al. discloses wherein the at least one carriergroup is determined

dynamically (paragraph 0023 states that the method can alternatively be applied during

operation to adapt the carrier constellations according to changes of the channel

characteristic, this means that the method can be performed dynamically during

operation depending on the characteristic of the channel).

(9) Regarding claim 19:

Peeters et al. discloses a method wherein the communication system is VDSL

system (paragraph 0019, lines 1-2).

(10) Regarding claim 20:

Peeters et al. discloses a modem for grouping a plurality of carriers in a DMT

communication system coupled to a far-end modem via a transmission channel (figure

1, the Rx modem and the Tx modem), the modem comprising:

carriergrouping means (channel analyzing circuitry (CHANNEL) in the Rx modem

in figure 1, paragraph 0019, lines 5) for determining multiple carrier groups for the

plurality of carriers and for determining at least one carriergroup parameter for each of

the multiple carrier groups (after channel analysis (measuring of the signal-to-noise ratio

of each carrier, the carriers are grouped in subsets of carriers where the same amount

of bits will be allocated, paragraph 0021, lines 3-5); and

carriergroup transmitting means (BiGi Tx of Rx modem in figure 1) for

transmitting messages (constellation information) comprising the at least one

carriergroup parameter to the far-end modem (Tx modem in figure 1) via the

transmission channel (line in figure 1), to enable the far-end modem to send and receive

messages using the multiple carrier groups (the bit loading and the gain information

contain in the constellation information is being used in the Tx and Rx modem for

transmission, paragraph 0008).

(11) Regarding claim 4 and 23:

Peeters discloses wherein the carriergroup parameter is a carriergroup bitloading parameter (the set of parameter value for a carrier subset may consist of a bit number, carrier belonging to the same subset will be modulated with an equal amount of bits, paragraph 0008).

(12) Regarding claim 5 and 24:

Peeters et al. discloses wherein the size of the multiple carrier groups is fixed (Peeters discloses another embodiment that the total of 4096 carriers are grouped into 8 subsets, each subset contains 512 carriers, paragraph 0005, lines 6-14).

(13) Regarding claim 6 and 25:

Peeters et al. discloses wherein the size of the multiple carrier groups vary (the subsets of carriers typically will not contain the same number of carriers, paragraph 0021, lines 7-9) (paragraph 0023 states that the method can alternatively be applied during operation to adapt the carrier constellations according to changes of the channel characteristic, this means that the method can be performed dynamically during operation depending on the characteristic of the channel).

Claim Rejections - 35 USC § 103

7.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8.   Claims 2-3, 9-10, 16, 21-22 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Peeters et al. (US 2001/0012783 A1).

(1) Regarding claims 2, 9, and 21:

Peeters et al. discloses all the subject matter except explicitly disclose wherein

the at least one carriergroup parameter transmitted by the carriergroup transmitting

means is a carriergroup SNR parameter for the plurality of carriergroup.

However, Peeters et al. discloses wherein the at least one carriergroup

parameter transmitted by the carriergroup transmitting means is a bit loading number for

the carriergroup for the plurality of carriergroup (paragraph 0020, lines 3-8).

It would have been obvious to one of ordinary skill in the art at the time of

invention to realize that the bit loading for a carrier is proportional to the signal-to-noise

ratio; with a high SNR, the carrier can transmit more bits; therefore the bit loading

information for a carriergroup is another from of representation of the signal-to noise

ratio. In the instant application, the far end modem receives the transmitted SNR

parameter and uses the SNR for determining the bit loading information for the carrier

group. Peeters et al. discloses that the near end modem used the measured SNR to

determine the bit loading information and then transmitted the bit loading information to

the far end modem. Therefore, it would have a matter if obvious design choice to one of

ordinary skill in the art.

(2) Regarding claim 3, 10, 16, 22:

Peeters further discloses that a bit number at which the carrier with the lowest

index in the subset should be transmitted (paragraph 0020, lines 6-7) (the examiner

interpret that the lowest index in the subset means the carrier with the lowest bit loading

number, it is means the carrier with the lowest signal-to-noises ratio, which is the worst

case SNR).

9.   Claims 7, 14 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Peeters et al. (US 2001/0012783 A1) in view of Gardner et al. (US 7,042,367 B2).

        Peeters et al. further discloses that the carriers belonging to the same subset will

be modulated with an equal amount of bits and will be transmitted with the same gain

(paragraph 0008). Peeters fails to explicitly discloses the at least one carriergroup

parameter is used to set up a tone encoder in a far end modem.

        However, Gardner et al. discloses wherein at least one message comprising the

at least one carriergroup parameter is used to set up a tone encoder in a far end

modem (the tone order and constellation encoder 84 in figure 5 assign bins to the data

and encodes the data, the number of bits per bin and the type of QAM coding to be

performed were previously determined during initialization, subchannel that contains a

high level of noise (lower signal to noise ratio) will be assigned to carry less data bits

than a less attenuated subchannel, after the data bits are assigned to each bin, QAM

constellation encoding takes place, column 8, line66 – column 9, line 12).

        It is desirable to for one message comprising the at least one carriergroup

parameter is used to set up a tone encoder in a far end modem because it can make

sure that the data rate requirement for transmission is being satisfied (column 13, lines

44-53). Therefore, it would have been obvious to one of ordinary skill in the art at the

time of invention to employ the teaching of Gardner et al. in the method of Peeters et al.

to improve the reliability of the method.

Conclusion

10.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure. Peeters et al. (US 5,790,550) discloses a method for allocating

data elements to a set of carriers, mapping unit and modulator to perform this method.

Humphrey (US 2002/0085640 A1) discloses multi-carrier connection initialization and

symbol transmission.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Siu M. Lee whose telephone number is (571) 270-1083.

The examiner can normally be reached on Mon-Fri, 7:30-4:00 with every other Friday

off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Chieh Fan can be reached on (571) 272-3042. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Siu M Lee
Examiner
Art Unit 2611
5/24/2007

CHIEH M. FAN
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